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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,702	09/28/2006	Ryoichi Okuyama	KPO-004	1795

32628 7590 10/05/2010

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EXAMINER	
BARROW, AMANDA J	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
10/05/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/594,702	OKUYAMA ET AL.	
	Examiner	Art Unit	
	AMANDA BARROW	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 July 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *47-77* is/are pending in the application.

4a) Of the above claim(s) *49,50 and 54-57* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *47,48,51-53 and 58-77* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Application

1. The Applicant's amendment filed on 7/29/2010 was received. Claims 47 and 48 were amended. A new non-final office action is presently being issued in light of additional prior art and double patenting rejections.

Applicants' remarks note that, "A new claim 78 is presented for examination;" however, no such claim is found in the incoming claims filed on 7/29/2010 as the claims stop at claim 77.

2. The texts of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on 3/30/2010.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. *The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided.* The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 47 and 48, and thus dependent claims 51-53 and 58-77, are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an organic compound-containing fuel capable of producing a proton as a result of electrochemical oxidization which can pass through a proton conductive partition membrane and which is preferably an alcohol such as methanol, ethanol, ethylene glycol, 2- propanol, aldehyde such as formaldehyde, carboxyl acid such as formic acid, or ether such as diethyl ether (paragraph 177), does not reasonably provide enablement for "an organic compound." The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The claimed invention must be enabled so that any person skilled in the art can make and use the invention without undue experimentation. In re Wands, 858 F.2d at 737, 8 USPQ2d at 1404 (Fed. Cir. 1988). See also United States v. Telectronics, Inc., 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988), MPEP § 2164.01(a) and § 2164.04. In reciting that the fuel contains an organic compound, the breadth of the claims is made so wide as to render an undue amount of experimentation needed to make or use the invention based on the content of the disclosure. Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The rejection under 35 U.S.C. 103(a) as being unpatentable over Kosek et al. (US 2003/0062268) in view of Narayanan et al. (US 2003/0226763) and evidenced by "Chemical Reaction" from Britannica Online Encyclopedia on claims 47, 51, 52, 58-65, 67, 70-74, 76 and 77 is maintained.

Regarding claim 47, Kosek discloses a hydrogen generating stack 12 which generates hydrogen gas by decomposing an organic fuel such as methanol (paragraphs 16 and 34) and comprises a membrane 18, an anode 16 ("fuel electrode") on one surface of the membrane 18, and a cathode 20 ("oxidizing electrode") on the other surface of the membrane 18 (see Figure 1; paragraph 16). Kosek teaches a pipe/channel that introduces methanol and water to the anode 16 (see Figure 1; paragraphs 16 and 34) and that the protons and some water are transported across the PEM to the cathode side of the cell 30. The protons are reduced along the cathode by externally transported electrons to form humidified hydrogen which is collected indirectly from the anode 16 and collected into a gas storage cylinder (paragraphs 4 and 24). Thus, the protons supplied act as the "oxidizing agent" as an "oxidizing agent" is defined as a species that gains electrons as evidenced by the article "Chemical reaction" from Britannica Online Encyclopedia.

Kosek discloses that the hydrogen generation system can be used for transportation applications including on board a vehicle (paragraph 4). Kosek does not specifically disclose that the hydrogen generation device is provided on an electric automobile and supplies hydrogen to a fuel cell which powers a motor; however, this concept is well known in the art. Narayanan discloses such a system in which a fuel cell 520 is supplied with hydrogen from an electrolyzer 100 (analogous to the hydrogen generating stack 12 of Kosek) and the electricity generated from

fuel cell is supplied to an engine to power an electrically-driven vehicle (see Figure 5; paragraphs 78 and 80).

Therefore, it would have been obvious to a person of ordinary skill in the art to place the electrolyzer of Kosek on the electric automobile system of Narayanan because Kosek teaches that the hydrogen generation system can be used for transportation applications and Narayana teaches a similar electrolyzer on board an electrically-driven vehicle and that such a system is widely used due to the simplicity of the electrolysis process equipment and its positive effects on the environment as the production of carbon monoxide is minimized (paragraphs 5 and 78-80).

Furthermore regarding claim 47, the claims recite means-plus-function which invokes a 35 U.S.C. 112, sixth paragraph limitation (see MPEP 2181). The claim recites, "means for supplying a fuel," "means for supplying an oxidizing agent," and "means for generating and collecting the gas containing hydrogen." The Applicant's specification supports and illustrates this language with the means for supplying fuel and oxidizing agents as feed channels the means for generating and collecting the hydrogen as a storage tank (see page 33 of the specification and Figure 2). The prior art applied (Kosek) teaches the same "means" as aforementioned in the rejection of claim 47.

Regarding claim 51, Kosek teaches that the electrochemical hydrogen generator comprises stacks with one or more cells that each contain an electrode assembly illustrated in Figure 1 (paragraph 5).

Regarding claim 52, Kosek teaches that operating the electrolyzer at near atmospheric pressure allows for the use of lower current densities without the decrease in Faradaic efficiency. Decreased current density may be achieved by distributing approximately the same amount of

electro-catalyst over a larger membrane surface, resulting in higher voltage efficiency of the electrolyzer (paragraph 8). It is well known that current and voltage are related through Ohm's law (V=IR).

Therefore, it would have been obvious to a person of ordinary skill in the art to modify the current density (and thus the voltage) by modifying the amount of electro-catalyst and area of the membrane surface in order to arrive at the desired efficiency of the electrolyzer. The discovery of an optimum value of a known result effective variable, without producing any new or unexpected results, is within the ambit of a person of ordinary skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980) (see MPEP § 2144.05, II.).

Regarding claims 58-62, Kosek teaches a system in which a fuel that may be a mixture of water and methanol is fed to the anode 16 of the hydrogen generation stack 12 where methanol is decomposed and protons and water ("oxidizing agent(s)") migrate across the membrane to the cathode where 20 where the proton accepts electrons and the formation of hydrogen gas is complete (see Figure 1 and paragraphs 16-17). The amount of hydrogen gas produced along with the amount of protons and water ("oxidizing agent(s)") that migrate across the membrane depend directly upon the voltage between the anode 16 and cathode 20 that allow the electrolyer to run and the volumes and concentrations of the methanol/water ("fuel") and protons/water ("oxidizing agent(s)") provided to the hydrogen generation stack 12 (paragraph 2). Therefore, it is inherent to the system that the amount of hydrogen gas evolved is adjusted when these variables are varied. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in

the reference. Inherency is not established by probabilities or possibilities. *In re Robertson*, 49 USPQ2d 1949 (1999).

Regarding claims 63 and 64, Kosek teaches that the preferred operating temperature range of the hydrogen generation system 12 is 25-80 °C (paragraph 33).

Regarding claims 65 and 66, Kosek teaches that the organic compound supplied to the fuel electrode may be methanol which is an alcohol (paragraph 34).

Regarding claim 67, Kosek teaches that the protons and some water are transported across the PEM to the cathode side of the cell 30. Thus, the "oxidizing agent" can also be viewed as the water that is transported across the PEM and as most of this is in vapor/gas form, the water ("oxidizing agent") is an oxygen containing gas.

Regarding claims 70 and 71, Kosek teaches that the ionic conductive membrane of the MEA may be a perfluorocarbon sulfonic acid membrane (paragraph 19).

Regarding claim 72, Kosek teaches that the electrodes of the MEA 100 include noble metal catalyst loadings including platinum and ruthenium that may be supported on carbon (see paragraph19; also see US Patent 4,311,569 which is incorporated into the teachings of Kosek and lists specific examples of platinum-ruthenium alloys). Furthermore, Narayanan also teaches that a platinum-ruthenium catalyst is used so that the only by-product of the electro-oxidation of methanol is carbon dioxide which is removed from the system (paragraphs 23 and 71).

Regarding claim 73, Kosek teaches that the electrodes of the MEA 100 include noble metal catalyst loadings including platinum which are supported by carbon or graphite as a base (paragraph 19).

Regarding claim 74, Kosek illustrates that the fuel containing methanol and water is circulated through the hydrogen generating stack 12 (see the arrows flowing into and out of the stack in Figure 1).

Regarding claim 76, modified Kosek shows the hydrogen produced by the electrolyzer 100 is supplied directly the fuel cell 520 without being cooled (see Figure 5 of Narayanan and the rejection of claim 1 for more details).

Regarding claim 77, Kosek does not teach that an insulating material for insulating a heat generated by the hydrogen generating device is provided as claimed.

7. The claim rejection 35 U.S.C. 103(a) as being unpatentable over Kosek et al. in view of Narayanan et al. and evidenced by "Chemical Reaction" from Britannica Online Encylopedia as applied to claims 47, 51-53, 58-62, 64, 65, 67, 70-74, 76 and 77 above, and further in view of Hsu (US Patent 5,948,221) on claim 68 is maintained.

Regarding claim 68, Kosek does not teach that the oxidizing agent is exhaust air exhausted from the fuel cell; however, it is well known in the art to recycle exhaust air from a fuel cell to provide to for reforming use (i.e. – hydrogen production). This is taught by Hsu who teaches a fuel cell array in which the exhaust is recycled and collected for hydrogen production (column 14, lines 57-65).

Therefore, it would have been obvious to a person of ordinary skill in the art to modify the invention of Kosek to recycle the fuel cell exhaust to the hydrogen generating device because Hsu teaches such a system and notes that the system provides a simplified and improved

electrochemical converter energy system that extracts waste heat generated by the fuel cell which allows for increased efficiency of the energy system (column 2, lines 12-20).

8. The rejection under 35 U.S.C. 103(a) as being unpatentable over Kosek et al. in view of Narayanan et al. and evidenced by "Chemical Reaction" from Britannica Online Encylopedia as applied to claims 47, 51-53, 58-62, 64, 65, 67, 70-74, 76 and 77 above, and further evidenced by Lehmann et al. (US Patent Application 2002/0036147) on claim 69 is maintained.

Regarding claim 69, Kosek teaches that the electrolyzer used may be a sodium sulfate electrolyzer wherein soldium sulfate/sulfuric acid is supplied to the anode ("fuel electrode") as a fuel. Lehmann gives evidence that in such an electrolysis cell, a hydrogen peroxide solution migrates across the membrane (paragraph 5). Thus, in this case, the "oxidizing agent" supplied to the cathode in the electrolyzer or Kosek is a hydrogen peroxide solution.

9. The rejection under 35 U.S.C. 103(a) as being unpatentable over Kosek et al. in view of Narayanan et al. and evidenced by "Chemical Reaction" from Britannica Online Encylopedia as applied to claims 47, 51-53, 58-62, 64, 65, 67, 70-74, 76 and 77 above, and further in view of Moulthrop, Jr. et al. (US Patent 6,383,361) on claim 75 is maintained.

Regarding claim 75, Kosek does not disclose a carbon dioxide absorbing portion in the hydrogen generating stack; however, Moulthrop teaches that the hydrogen gas produced through electrolytic methods often includes carbon dioxide which contaminates the electrolyte membrane catalysts thereby decreasing the operation efficiency and contaminating the product gas stream.

As such, Moulthrop provides filters to purify/absorb the carbon dioxide produced by the electrolytic cell (column 1, lines 26-62).

Therefore, it would have been obvious to a person of ordinary skill in the art to modify the electrolytic cell of Kosek to include a carbon dioxide filtration or absorption system because Moulthrop teaches such a system and that carbon dioxide produced along with the hydrogen gas in an electrolytic cell needs to be removed as it contaminates the membrane catalysts and product stream and decreases operation efficiency (column 1, lines 26-62).

10. Claims 47 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ye et al., "Electrochemical Reactions in a DMFC under Open-Circuit Conditions," Electrochemical and Solid-State Letters, 8 (1) A52-A54 (2005) in view of Narayanan et al. (US Patent Application 2003/0226763).

Regarding claims 47 and 48, Ye discloses the use of membrane electrode assembly having two electrodes (i.e., anode/fuel electrode and cathode/oxidant electrode) sandwiching a Nafion membrane ("partition membrane") which are provided two channels formed on both the cathode and anode side for delivering oxygen and methanol ("fuel containing an organic compound"), respectively (Experimental section). The cell ("hydrogen generating device") is maintained under open-circuit conditions and the evolution of hydrogen gas is observed which was collected from the anode (pg. A52, column 1, third paragraph and pg. A54, column 1, paragraph 1). Ye does not disclose that the cell provides the hydrogen to a fuel cell provided on an electric automobile such that the fuel drives a motor; however, Narayanan discloses such a system in which a fuel cell 520 is supplied with hydrogen from an electrolyzer 100 (i.e., a

hydrogen generating source analogous in structure to the hydrogen generating source of Ye), and the electricity generated from fuel cell is supplied to an engine to power an electrically-driven vehicle (see Figure 5; paragraphs 78 and 80).

Therefore, it would have been obvious to a person of ordinary skill in the art to place the cell ("hydrogen generating device") of Ye on the electric automobile system of Narayanan Narayana teaches a similar hydrogen generating device (electrolyzer 100) on board an electrically-driven vehicle and that such a system is widely used due to the simplicity of the process equipment and its positive effects on the environment as the production of carbon monoxide is minimized (paragraphs 5 and 78-80).

Furthermore regarding claims 47 and 48, the claims recite means-plus-function which invokes a 35 U.S.C. 112, sixth paragraph limitation (see MPEP 2181). The claim recites, "means for supplying a fuel," "means for supplying an oxidizing agent," and "means for generating and collecting the gas containing hydrogen." The Applicant's specification supports and illustrates this language with the means for supplying fuel and oxidizing agents as feed channels the means for generating and collecting the hydrogen as a storage tank (see page 33 of the specification and Figure 2).

11. Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ye et al., "Electrochemical Reactions in a DMFC under Open-Circuit Conditions," Electrochemical and Solid-State Letters, 8 (1) A52-A54 (2005) in view of Narayanan et al. (US Patent Application 2003/0226763) as applied to claim 48, and further in view of Kosek et al. (US 2003/0062268).

Regarding claims 53, Ye is silent as to the voltage between the anode and cathode of the cell ("hydrogen generating device"), however Kosek teaches that operating hydrogen generating stack 12 which is analogous in structure to Ye's cell at near atmospheric pressure allows for the use of lower current densities without the decrease in Faradaic efficiency. Decreased current density may be achieved by distributing approximately the same amount of electro-catalyst over a larger membrane surface, resulting in higher voltage efficiency of the electrolyzer (paragraph 8). It is well known that current and voltage are related through Ohm's law (V=IR).

Therefore, it would have been obvious to a person of ordinary skill in the art to modify the current density (and thus the voltage) by modifying the amount of electro-catalyst and area of the membrane surface in order to arrive at the desired efficiency of the hydrogen generating device. The discovery of an optimum value of a known result effective variable, without producing any new or unexpected results, is within the ambit of a person of ordinary skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980) (see MPEP § 2144.05, II.).

Priority

12. Applicant is advised of possible benefits under 35 U.S.C. 119(a)-(d), wherein an application for patent filed in the United States may be entitled to the benefit of the filing date of a prior application filed in a foreign country.

Should applicant desire to obtain the benefit of foreign priority under 35 U.S.C. 119(a)-(d) prior to declaration of an interference, a certified English translation of the foreign application must be submitted in reply to this action. 37 CFR 41.154(b) and 41.202(e).

Failure to provide a certified translation may result in no benefit being accorded for the non-English application.

The reference Ye et al., "Electrochemical Reactions in a DMFC under Open-Circuit Conditions," Electrochemical and Solid-State Letters, 8 (1) A52-A54 (2005) used to reject independent claims 47 and 48 is an intervening reference and may be overcome if a certified English translation of the foreign application(s) are provided in reply to this action. 37 CFR 41.154(b) and 41.202(e).

Double Patenting

13. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting

ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

14. Claims 47, 48, 51-53 and 58-77 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 48, 50-52, 54-65, 67, 69, 71 and 72 of **copending Application No. 10/594,711** in view of Narayanan et al. (US 2004/0062268).

The common subject matter is a hydrogen supply means, hydrogen storing means, and hydrogen generating device which supplied hydrogen to the hydrogen supply means and generates a gas containing hydrogen by decomposing an organic compound, the hydrogen generating device comprising a partition membrane, a fuel electrode provided on one surface of the partition membrane, means for supplying the fuel containing the organic compound and water to the fuel electrode, an oxidizing electrode provided on the other surface of the partition membrane, means for supplying the oxidizing agent to the oxidizing electrode, and means for generating and collecting the gas containing hydrogen from the fuel electrode.

Copending Application No. 10/594,711 does not disclose an electric automobile provided with the hydrogen generating device, a fuel cell for power generation by supply of hydrogen and oxidizing agent, or a motor driven by electricity generated by the fuel cell as recited in the

current claim set; however, the combination of such components with a hydrogen generating device is well known in the art as taught by Narayanan who discloses such a system in which a fuel cell 520 is supplied with hydrogen from an electrolyzer 100 ("hydrogen generating device") and the electricity generated from fuel cell is supplied to an engine to power an electrically-driven vehicle (see Figure 5; paragraphs 78 and 80).

Therefore, it would have been obvious to a person of ordinary skill in the art to place the hydrogen generating device on an electric automobile system because Narayanan a similar hydrogen generating device on board an electrically-driven vehicle and that such a system is widely used due to the simplicity of the electrolysis process equipment and its positive effects on the environment as the production of carbon monoxide is minimized (paragraphs 5 and 78-80).

This is a provisional obviousness-type double patenting rejection.

15. Claims 47, 48, 51-53 and 58-77 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-35 of **copending Application No. 11/794,320** in view of Narayanan et al. (US 2004/0062268).

The common subject matter is a fuel cell and a hydrogen generating device which generates a gas containing hydrogen by decomposing an organic compound, the hydrogen generating device comprising a partition membrane, a fuel electrode provided on one surface of the partition membrane, means for supplying the fuel containing the organic compound and water to the fuel electrode, an oxidizing electrode provided on the other surface of the partition membrane, means for supplying the oxidizing agent to the oxidizing electrode, and means for generating and collecting the gas containing hydrogen from the fuel electrode.

Copending Application No. 11/794,320 does not disclose an electric automobile provided with the hydrogen generating device, a fuel cell for power generation by supply of hydrogen and oxidizing agent, or a motor driven by electricity generated by the fuel cell as claimed in the present claim set; however, the combination of such components with a hydrogen generating device is well known in the art as taught by Narayanan who discloses such a system in which a fuel cell 520 is supplied with hydrogen from an electrolyzer 100 ("hydrogen generating device") and the electricity generated from fuel cell is supplied to an engine to power an electrically-driven vehicle (see Figure 5; paragraphs 78 and 80).

Therefore, it would have been obvious to a person of ordinary skill in the art to place the hydrogen generating device on an electric automobile system because Narayanan a similar hydrogen generating device on board an electrically-driven vehicle and that such a system is widely used due to the simplicity of the electrolysis process equipment and its positive effects on the environment as the production of carbon monoxide is minimized (paragraphs 5 and 78-80).

This is a provisional obviousness-type double patenting rejection.

16. Claims 47, 48, 51-53 and 58-77 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 30-57 of **copending Application No. 11/988,034** in view of May et al. (US 2001/0021470).

The common subject matter is a hydrogen generating device which generates a gas containing hydrogen by decomposing an organic compound, the hydrogen generating device comprising a partition membrane, a fuel electrode provided on one surface of the partition membrane, means for supplying the fuel containing the organic compound and water to the fuel

electrode, an oxidizing electrode provided on the other surface of the partition membrane, means for supplying the oxidizing agent to the oxidizing electrode, and means for generating and collecting the gas containing hydrogen from the fuel electrode.

The present application not positively recite flow channels provided to the electrodes on fuel and oxidant electrode separators in order to provide fuel and oxidizing agent; however, May discloses the use of bipolar or separator plates in a fuel cell with a series of flow channels which ensure even distribution of input gases over the electrode surfaces (paragraph 6). Therefore, it would have been obvious to a person of ordinary skill in the art to include bipolar/separator plates with flow channels in the present invention because May teaches that this provides for even distribution of input gases over the electrode surfaces (paragraph 6).

This is a provisional obviousness-type double patenting rejection.

17. Claims 47, 48, 51-53 and 58-77 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-39 of **copending Application No. 11/794,357** in view of Narayanan et al. (US 2004/0062268).

The common subject matter is a fuel cell, an auxiliary machine ("motor") and a hydrogen generating device which generates a gas containing hydrogen by decomposing an organic compound, the hydrogen generating device comprising a partition membrane, a fuel electrode provided on one surface of the partition membrane, means for supplying the fuel containing the organic compound and water to the fuel electrode, an oxidizing electrode provided on the other surface of the partition membrane, means for supplying the oxidizing agent to the oxidizing

electrode, and means for generating and collecting the gas containing hydrogen from the fuel electrode.

Copending Application No. 11/794357 does not disclose an electric automobile provided with the hydrogen generating device, a fuel cell for power generation by supply of hydrogen and oxidizing agent, or a motor driven by electricity generated by the fuel cell; however, the combination of such components with a hydrogen generating device is well known in the art as taught by Narayanan who discloses such a system in which a fuel cell 520 is supplied with hydrogen from an electrolyzer 100 ("hydrogen generating device") and the electricity generated from fuel cell is supplied to an engine to power an electrically-driven vehicle (see Figure 5; paragraphs 78 and 80).

Therefore, it would have been obvious to a person of ordinary skill in the art to place the hydrogen generating device on an electric automobile system because Narayanan a similar hydrogen generating device on board an electrically-driven vehicle and that such a system is widely used due to the simplicity of the electrolysis process equipment and its positive effects on the environment as the production of carbon monoxide is minimized (paragraphs 5 and 78-80).

This is a provisional obviousness-type double patenting rejection.

18. Claims 47, 48, 51-53 and 58-77 are rejected on the ground of nonstatutory double patenting over claims 1-31 of **U. S. Patent No. 7,476,456** since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter,

as follows: a fuel cell and a hydrogen generating device which generates a gas containing hydrogen by decomposing an organic compound, the hydrogen generating device comprising a partition membrane, a fuel electrode provided on one surface of the partition membrane, means for supplying the fuel containing the organic compound and water to the fuel electrode, an oxidizing electrode provided on the other surface of the partition membrane, means for supplying the oxidizing agent to the oxidizing electrode, and means for generating and collecting the gas containing hydrogen from the fuel electrode.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Response to Arguments

19. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Applicants' remaining principle arguments:

(a) *In regards to the rejection under Kosek in view of Narayanan which is evidenced by "Chemical Reaction," Applicant argues that Kosek does not provide means for collecting the gas containing hydrogen from the fuel electrode.*

In response to Applicant's arguments:

(a) Kosek discloses that the hydrogen generating gas is directly obtained from the oxidant electrode, and thus indirectly from the fuel electrode. As such, Kosek still reads on the claims. If Applicant defines that the gas is *directly* obtained from the fuel electrode, the rejection may be overcome.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AMANDA BARROW whose telephone number is (571)270-7867. The examiner can normally be reached on 7:30am-5pm EST. Monday-Friday, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/AMANDA BARROW/
Examiner, Art Unit 1795

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Supervisory Patent Examiner, Art Unit 1795